

Abstract

The present invention discloses a type of nanostructured ceramic platform for gas sensors and sensor arrays. These sensors comprise micromachined anodic aluminum oxide films, which contains extremely high density (e.g.,  $10^{11}$   $\text{cm}^{-2}$ ) 5 nanoscale pores. Sensing materials deposited inside this self-organized network of nanopores have ultra-high surface area and nanometer grain structure, therefore enabling high sensitivity. Refractory nature of alumina ceramic enables the desired robustness, long lifetime and stability in harsh environment. This sensor platform can been used for both chemical gas and physical (humidity, temperature) sensors and 10 sensor arrays.